

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
25 April 2002 (25.04.2002)

PCT

(10) International Publication Number  
**WO 02/32786 A1**

(51) International Patent Classification: **B65D 85/10, 5/66**

(21) International Application Number: PCT/IT01/00524

(22) International Filing Date: 16 October 2001 (16.10.2001)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
B02000A000609 18 October 2000 (18.10.2000) IT

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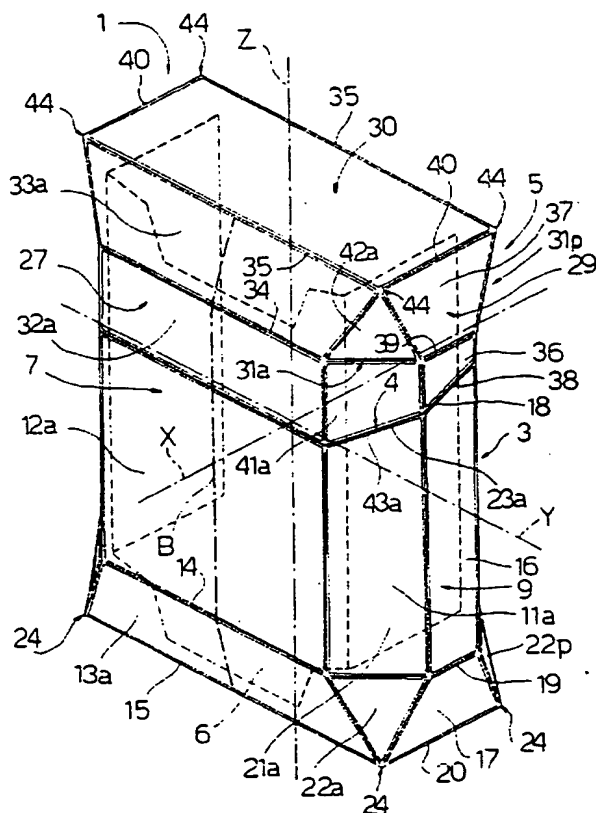
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(81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PI, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

(84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European

[Continued on next page]

(54) Title: **HINGED-LID CIGARETTE PACKET**



(57) Abstract: A rigid hinged-lid cigarette packet has a longitudinal axis (Z), a cup-shaped container (3), a cup-shaped lid (5), main walls (7, 8, 9, 10, 27, 28, 29, 30), and at least one connecting wall (11a, 11p, 31a, 31p) having a first panel (22a, 22p, 42a, 42p) sloping with respect to the longitudinal axis (Z) to define differently shaped sections at least along a portion of the longitudinal axis (Z); and at least one of the main walls (7, 8, 9, 10, 27, 28, 29, 30) has a second panel (13a, 13p, 33a, 33p) sloping in the opposite direction to the first panel (22a, 22p, 42a, 42p), so that each section perpendicular to the longitudinal axis has the same perimeter as any other section perpendicular to the longitudinal axis.

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patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

*before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

**Published:**

*with international search report*

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## HINGED-LID CIGARETTE PACKET

TECHNICAL FIELD

10 The present invention relates to a rigid hinged-lid cigarette packet.

BACKGROUND ART

A conventional rigid hinged-lid packet is normally in the form of a right parallelepiped extending along a longitudinal axis and comprising a cup-shaped container  
15 having five walls, and a cup-shaped lid having five walls and hinged to the container by a hinge between the rear wall of the container and the rear wall of the lid. The above type of packet is formed from a cardboard blank  
20 comprising preformed fold lines, along which it is folded to form the packet. The packet of cigarettes is subsequently wrapped in a sheet of overwrapping material, which, for economic and ecological reasons, is extremely thin, so that the slightest flaw in assembly of the  
25 packet is sufficient to crease or stretch the sheet, thus seriously impairing the appearance of the packet.

Over the past few years, variations of the conventional packet described above have been marketed,

and in which the edges formed by the walls of the packet and parallel to the longitudinal axis are beveled or rounded by means of connecting walls parallel to the longitudinal axis of the packet. Patent Application EP-A-  
5 930,245 also relates to a type of hinged-lid cigarette packet comprising at least one connecting wall sloping at an angle of other than zero with respect to the longitudinal axis, so that the section of the packet perpendicular to the longitudinal axis varies in shape  
10 along the longitudinal axis.

The variation in section along the longitudinal axis is for aesthetic or technical reasons, e.g. to compress the cigarettes in given portions of the packet.

Variable-section packets, however, have the drawback  
15 of the sloping wall creasing or stretching the overwrapping material subsequently applied to the packet.

#### DISCLOSURE OF INVENTION

It is an object of the present invention to provide a variable-section, rigid hinged-lid packet designed to  
20 eliminate the drawbacks of the known state of the art.

According to the present invention, there is provided a rigid hinged-lid cigarette packet; the packet having a longitudinal axis, and comprising a cup-shaped container, a cup-shaped lid, main walls, and at least one  
25 connecting wall having a first panel sloping with respect to said longitudinal axis to define differently shaped sections at least along a portion of the longitudinal axis; and the packet being characterized in that at least

one of the main walls comprises a second panel sloping in the opposite direction to said first panel, so that each section has a perimeter equal to the perimeter of any other section perpendicular to the longitudinal axis.

5 It is a further object of the present invention to provide a blank from which to form the packet according to the present invention.

According to the present invention, there is provided a flat blank from which to form a rigid hinged-  
10 lid cigarette packet; characterized by being elongated in shape along an axis of extension, and comprising a preformed crease line perpendicular to said axis of extension, and two slits separating panels of the container from panels of the lid; said preformed crease  
15 line forming a hinge of the packet, between the container and the lid, and being located astride said axis of extension and defined laterally by said slits, each of which comprises a slit portion aligned axially with said hinge.

20 BRIEF DESCRIPTION OF THE DRAWINGS

A number of non-limiting embodiments of the present invention will be described by way of example with reference to the accompanying drawings, in which:

Figure 1 shows a view in perspective of the front, top and lateral sides of a rigid hinged-lid packet in  
25 accordance with the present invention;

Figure 2 shows a plan view of the Figure 1 packet;

Figure 3 shows a spread-out view of a blank from

which to form the Figure 1 packet;

Figure 4 shows an intermediate cross section of the Figure 1 packet;

Figure 5 shows a view in perspective of the rear,  
5 bottom and lateral sides of the Figure 1 packet.

#### BEST MODE FOR CARRYING OUT THE INVENTION

With reference to Figures 1, 2, 4 and 5, number 1 indicates a rigid hinged-lid packet for cigarettes 2, having a major longitudinal axis Z, and two transverse  
10 axes X and Y perpendicular to each other and to the Z axis.

Packet 1 houses an orderly group G of cigarettes 2, and comprises a cup-shaped container 3 having an open end 4; and a cup-shaped lid 5 hinged to container 3 to rotate  
15 about a hinge C between an open position (not shown) and a closed position closing end 4 (Figure 5). Packet 1 also comprises a shaped collar 6, which is located astride container 3 and lid 5 to project outwards of end 4, and, as explained in more detail later on, defines, together  
20 with packet 1, a compartment V for housing cigarettes 2.

Container 3 comprises a front wall 7 and a rear wall 8 facing each other; two facing lateral walls 9; and a rectangular bottom wall 10 perpendicular to the Z axis. Front wall 7 is connected to walls 9 by two front  
25 connecting walls 11a, and rear wall 8 is connected to walls 9 by two rear connecting walls 11p.

With reference to Figure 1, front wall 7 of container 3 comprises a rectangular panel 12a crosswise

to the X axis and parallel to the Z axis; and a trapezoidal panel 13a, which has a minor base 14 in common with panel 12a, and a major base 15 in common with wall 10, slopes with respect to both the X and Z axes, and converges towards the Z axis as of panel 12a.

With reference to Figure 5, rear wall 8 of container 3 comprises a rectangular panel 12p crosswise to the X axis and parallel to the Z axis; and a trapezoidal panel 13p, which has a minor base 14 in common with panel 12p, and a major base 15 in common with wall 10, slopes with respect to both the X and Z axes, and converges towards the Z axis as of panel 12p.

Each lateral wall 9 of container 3 comprises a panel 16 in the form of a right trapezium, an oblique side 18 of which defines part of end 4 and is crosswise to the Y axis and parallel to the Z axis; and a panel 17 in the form of an isosceles trapezium having a minor base 19 in common with panel 16, and a major base 20 in common with wall 10. Panel 17 slopes with respect to both the Y and Z axes, and converges towards the Z axis as of panel 16.

With reference to Figure 1, each front connecting wall 11a comprises a trapezoidal panel 21a and a triangular panel 22a. Panel 21a defines a right trapezium, an oblique side 23a of which defines part of end 4 and connects panel 12a to a panel 16, while panel 22a diverges from the Z axis as of panel 21a and defines an isosceles triangle whose catheti are defined by the oblique sides of relative panels 13a and 17, and whose

apex 24 is in common with an apex of wall 10.

With reference to Figure 5, each rear connecting wall 11p comprises a trapezoidal panel 21p and a triangular panel 22p. Panel 21p defines a right  
5 trapezium, an oblique side 23p of which defines part of end 4 and connects panel 12p to a panel 16, while panel 22p diverges from the Z axis as of panel 21p and defines an isosceles triangle whose catheti are defined by the oblique sides of relative panels 13p and 17, and whose  
10 apex 24 is in common with an apex of wall 10.

In other words, each triangular panel 22a, 22p slopes, with respect to the Z axis, in the opposite direction to trapezoidal panels 13a, 13p and 17.

With reference to Figures 1, 2 and 5, lid 5  
15 comprises a front wall 27 and a rear wall 28 facing each other; two facing lateral walls 29; and a top wall 30 perpendicular to the Z axis. Front wall 27 is connected to walls 29 by two front connecting walls 31a; rear wall 28 is connected to walls 29 by two rear connecting walls  
20 31p; and wall 30 is rectangular and adjacent to walls 27, 28 and 29.

With reference to Figure 1, front wall 27 comprises a rectangular panel 32a and a trapezoidal panel 33a. Panel 32a is crosswise to the X axis, parallel to the Z  
25 axis and coplanar with panel 12a; while panel 33a, in addition to having a respective minor base 34 in common with panel 32a, and a respective major base 35 in common with wall 30, slopes with respect to both the X and Z



axes, and converges towards the Z axis as of panel 32a.

With reference to Figure 5, wall 28 comprises a panel 33p, which is adjacent to panel 12p of rear wall 8 of container 3 along the respective minor base 34, along which extends hinge C between container 3 and lid 5. Panel 33p is also adjacent to wall 30 along the respective major base 35 of the trapezium defining wall 33p. Each panel 33a, 33p of lid 5 is the same shape and size as panels 13a and 13p of container 3, and converges towards the Z axis and wall 30.

Each lateral wall 29 of lid 5 comprises a panel 36 in the form of a right trapezium, and a panel 37 in the form of an isosceles trapezium. Panel 36, in addition to defining a right trapezium with a hypotenuse 38 facing side 18, is crosswise to the Y axis, parallel to the Z axis and coplanar with relative panel 16; while panel 37, in addition to defining an isosceles trapezium with a minor base 39 in common with panel 36, and a major base 40 in common with wall 30, slopes with respect to both the Y and Z axes. Each panel 37 of lid 5 is the same shape and size as panels 17 of container 3, and converges towards the Z axis as of respective panels 36.

With reference to Figure 1, each front connecting wall 31a comprises a panel 41a in the form of a right trapezium, and a panel 42a in the form of an isosceles triangle. Panel 41a, in addition to defining a right trapezium having an oblique side 43a facing relative side 23a, connects a panel 32a to a panel 36; while panel 42a

diverges from the Z axis as of panel 41a, and defines an isosceles triangle, whose catheti are defined by the oblique sides of relative panels 33a and 37, and whose apex 44 coincides with an apex of wall 30.

5        With reference to Figure 5, rear connecting wall 31p comprises a panel 41p in the form of a right triangle, and a panel 42p in the form of an isosceles triangle. Panel 41p has an oblique side 43p facing relative side 23p, and connects a panel 32p to a panel 36; while panel  
10    42p diverges from the Z axis as of panel 41p, and defines an isosceles triangle, whose catheti are defined by the oblique sides of relative panels 33p and 37, and whose apex 44 coincides with an apex of wall 30.

Each panel 42a, 42p of lid 5 is identical with  
15    relative panel 22a, 22p of container 3; and each triangular panel 42a, 42p slopes, with respect to the Z axis, in the opposite direction to trapezoidal panels 33a and 37.

With reference to Figures 1 and 5, panels 12a and  
20    32a of walls 7 and 27, panel 12p of wall 8, the two panels 16 and 36 of walls 9 and 29, and panels 21a, 21p, 41a and 41p of walls 11a, 11p, 31a and 31p define a central portion K1 of packet 1. The intersection of  
portion K1 with a plane perpendicular to the Z axis  
25    defines an octagonal section, which is constant in shape and size along the Z axis and has a given perimeter P1. Panels 13a, 13p and 33a, 33p of walls 7, 8, 27 and 28, panels 17 and 37 of walls 9 and 29, and panels 22a, 22p,

42a and 42p of walls 11a, 11p, 31a and 31p define on packet 1 two end portions K2 connecting octagonal-section portion K1 to rectangular walls 10 and 30. Each portion K2 has an octagonal section varying in shape along the Z axis to eventually become a rectangle at wall 10, 30. Despite portion K2 varying in section, the perimeter P2 equals perimeter P1 by virtue of the different slope of the panels.

Moreover, sectioning packet 1 in XZ planes crosswise to and along the Y axis defines on walls 7 and 27 and walls 8 and 28 of packet 1 a series of broken longitudinal edges B (only one shown by the dot-and-dash line) which are of constant length, regardless of the position of the XZ planes.

The above conditions - the constancy of perimeters P1 and P2 of any section of packet 1 in XY planes, and of the longitudinal edges B defined sectioning packet 1 in XZ planes - enables packet 1 to be overwrapped using normal known transparent sheets of overwrapping material (not shown) with no creasing or stretching of the sheets.

As shown clearly in Figures 1 and 4, collar 6 comprises a central panel 45 close to panels 12a and 32a; and two lateral panels 46 parallel to the XZ plane to form compartment V together with walls 10 and 30 and panels 12p and 33p of walls 8 and 28.

With reference to Figures 1 and 2, panel 33p is adjacent to panel 12p along the minor side 34 of the trapezium, and is hinged to panel 12p along hinge C,

which coincides with a central portion of side 34. That is, the length of hinge C is shorter than the width of wall 12p and the length of side 34.

As shown in Figure 3, packet 1 is formed from an elongated flat blank 51 extending along an axis A of symmetry. Blank 51 comprises a number of panels corresponding to the panels of packet 1, and which are indicated in Figure 3 using the same reference numbers, plus a ('), as for the corresponding panels of packet 1; and panels which in packet 1 adhere to panels of the same shape and size, and which are indicated in Figure 3 using the same reference numbers as for the panels to which they adhere, plus the letter "i" to indicate they are not visible from outside packet 1.

Blank 51 comprises a flap 52, which is folded onto panel 32a'; two tabs 53 for strengthening lid 5; and two tabs 54 for strengthening container 3. Panels 10, 12a', 12p', 13a', 13p', 16', 16i', 17', 17i', 21a', 21p', 22a', 22p', 36', 36i', 37', 37i', 41a', 41p', 42a', 42p', flap 52, and tabs 53 and 54 are separated by fold lines or slits described in detail below.

Blank 51 comprises nine preformed fold lines 55, ..., 63 perpendicular to axis A; and four preformed fold lines 64, 65, 66, 67 parallel to axis A and extending along a first portion at panel 32a', a second portion at panel 12p', and a third portion at panel 12a'. Each tab 53 is separated from the adjacent panel 37' by a slit 68 aligned with line 57, and from panel 30' by a slit 69

parallel to axis A. Similarly, each tab 54 is separated from the adjacent panel 17' by a slit 70 aligned with line 62, and from panel 10 by a slit 71 parallel to axis A.

5        Each panel 42a' is triangular, and is separated from panel 41a' by line 56, and from panels 37' and 33a' by respective preformed fold lines 72 and 73 sloping in opposite directions with respect to axis A. Each panel 42p' is triangular, and is separated from panel 41p' by  
10   line 59, and from panels 37i' and 33p' by respective preformed fold lines 74 and 75 sloping in opposite directions with respect to axis A. Each panel 22p' is triangular, and is separated from panel 21p' by line 60, and from panels 17i' and 13p' by respective preformed  
15   fold lines 76 and 77 sloping in opposite directions with respect to axis A.

Each panel 22a' is triangular, and is separated from the adjacent panel 21a' by line 63, and from panels 17' and 13a' by respective preformed fold lines 78 and 79  
20   sloping in opposite directions with respect to axis A.

Blank 51 also comprises a further two slits 80 on opposite sides of axis A. Each slit 80 comprises an outer portion 81 sloping with respect to axis A and separating panel 16i' from panel 36i', and panel 21p' from panel  
25   41p'; and an inner portion 82 aligned with line 59 and separating panel 12p' partly from panel 33p'. The portion of line 59 between portions 82 coincides with hinge C. Each slit 80 is not continuous, blank 51 comprising

bridges 83 between panel 16i' and panel 36i', between panel 21p' and panel 41p', and between panel 12p' and panel 33p'. Bridges 83 prevent blank 51, on account of the relatively deep slits 80, from being deformed when forming packet 1, and are torn when packet 1 is unsealed.

## CLAIMS

1) A rigid hinged-lid cigarette packet; the packet (1) having a longitudinal axis (Z), and comprising a cup-shaped container (3), a cup-shaped lid (5), main walls (7, 8, 9, 10, 27, 28, 29, 30), and at least one connecting wall (11a, 11p, 31a, 31p) having a first panel (22a, 22p, 42a, 42p) sloping with respect to said longitudinal axis (Z) to define differently shaped sections at least along a portion of the longitudinal axis (Z); and the packet being characterized in that at least one of the main walls (7, 8, 9, 10, 27, 28, 29, 30) comprises a second panel (13a, 13p, 33a, 33p) sloping in the opposite direction to said first panel (22a, 22p, 42a, 42p), so that each section has a perimeter equal to the perimeter of the other sections perpendicular to the longitudinal axis (Z).

2) A packet as claimed in Claim 1, characterized in that said main walls (7, 8, 9, 10, 27, 28, 29, 30) comprise two end walls (10, 30) crosswise to said longitudinal axis (Z); at least one of the two said end walls (10, 30) being rectangular; and each section perpendicular to the longitudinal axis (Z) and between the two end walls being octagonal.

3) A packet as claimed in Claim 2, characterized in that both said end walls (10, 30) are rectangular.

4) A packet as claimed in Claim 3, characterized by comprising a central portion (K1) having a constant

octagonal section along said longitudinal axis (Z); and two end portions (K2) located at opposite ends of the central portion, and each having a variable octagonal section.

5           5) A packet as claimed in any one of Claims 1 to 4, characterized by comprising two transverse axes (X, Y) perpendicular to each other and to said longitudinal axis (Z); said connecting wall (11a, 11p, 31a, 31p) sloping with respect to said transverse axes (X, Y).

10           6) A packet as claimed in any one of Claims 1 to 5, characterized in that said main walls (7, 8, 9, 10, 27, 28, 29, 30) comprise front walls (7, 27), rear walls (8, 28) and lateral walls (9, 29).

          7) A packet as claimed in Claim 6, characterized by  
15 comprising a number of connecting walls (11a, 11p, 31a, 31p); each front wall (7, 27) being connected by a connecting wall (11a, 31a) to a lateral wall (9, 29); and each rear wall (8, 28) being connected by a connecting wall (11p, 31p) to a lateral wall (9, 29).

20           8) A packet as claimed in Claim 7, characterized in that said container (3) comprises four connecting walls (11a, 11p), each comprising a said first panel (22a, 22p); a front wall (7) comprising a said second panel (13a); a rear wall (8) comprising a respective second  
25 panel (13p); and two lateral walls (9), each comprising a respective second panel (17):

          9) A packet as claimed in Claim 7, characterized in that said lid (5) comprises four connecting walls (31a,



31p), each comprising a said first panel (42a, 42p); a front wall (27) comprising a said second panel (33a); a rear wall (28) comprising a respective second panel (33p); and two lateral walls (29), each comprising a  
5 respective second panel (37).

10) A packet as claimed in Claim 8 or 9, characterized in that said first panels (22a, 22p, 42a, 42p) are in the form of an isosceles triangle; and said second panels (13a, 13p, 33a, 33p) are in the form of an  
10 isosceles trapezium.

11) A packet as claimed in Claim 8 or 9, characterized by comprising a hinge line (C) crosswise to said longitudinal axis (Z) and located between the rear wall (8) of said container (3) and the rear wall (28) of  
15 said lid (5); said hinge extending along an edge (34) of the second panel (33p) of the lid (5).

12) A packet as claimed in Claim 8 or 9, characterized in that the intersections between planes parallel to the longitudinal axis (Z) and the front walls  
20 (7, 27) and rear walls (8, 28) define respective longitudinal edges (B) of constant length.

13) A packet as claimed in Claim 10, characterized in that said hinge (C) is of a length shorter than said edge (34) of said second panel (33p) of the lid.

25 14) A flat blank from which to form a rigid hinged-lid cigarette packet; characterized by being elongated in shape along an axis (A) of extension, and comprising a preformed crease line (59) perpendicular to said axis (A)

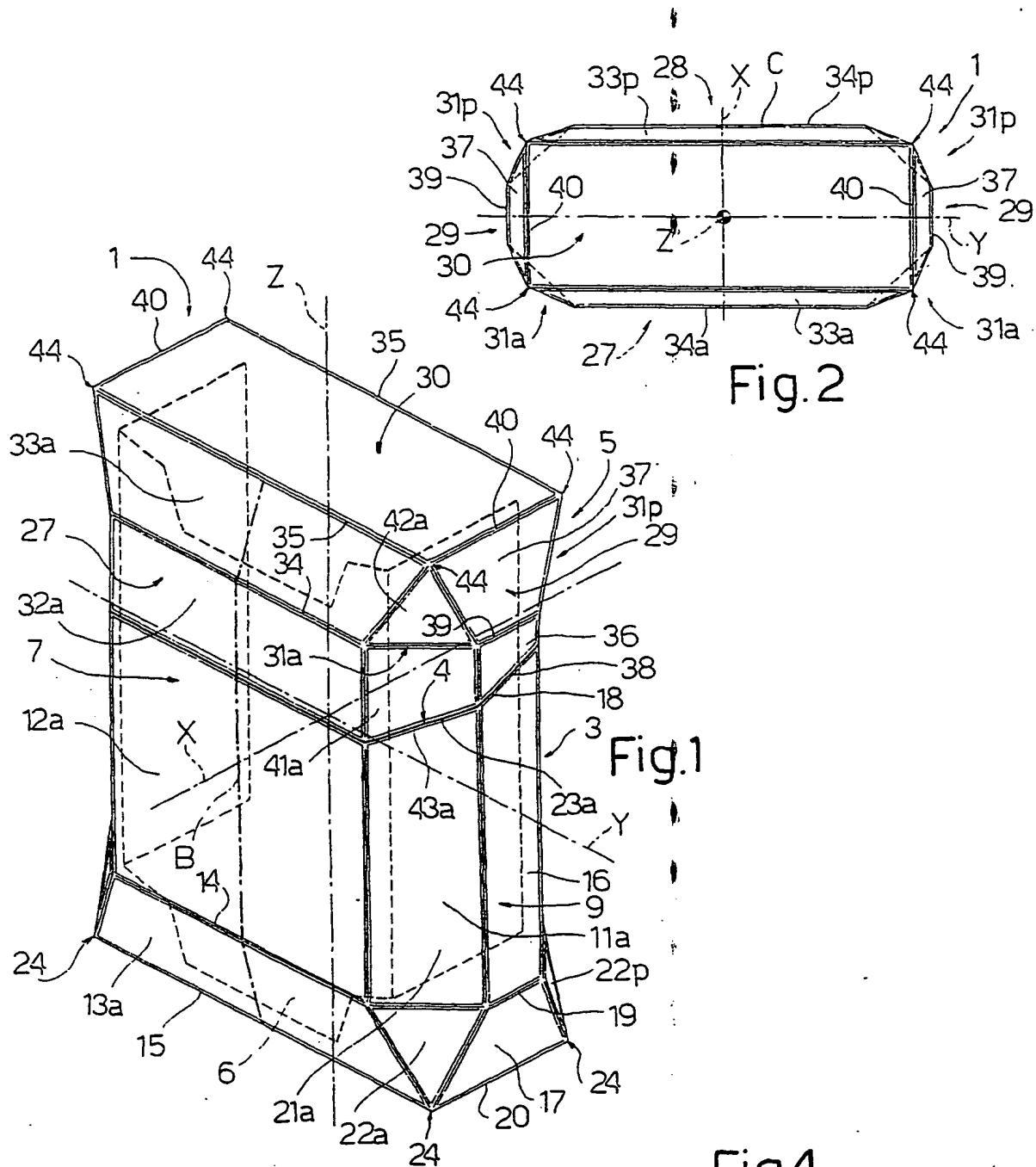
of extension, and two slits (80) separating panels (12p', 21p', 16i') of the container (3) from panels (33p', 41p', 36i') of the lid (5); said preformed crease line (59) forming a hinge (C) of the packet (1) between the  
5 container (3) and the lid (5), and being located astride said axis (A) of extension and defined laterally by said slits (80), each of which comprises a slit portion (82) aligned axially with said hinge (C).

15 15) A blank as claimed in Claim 14, characterized in that said preformed crease line (59) is a fold line by which to form said packet (1).

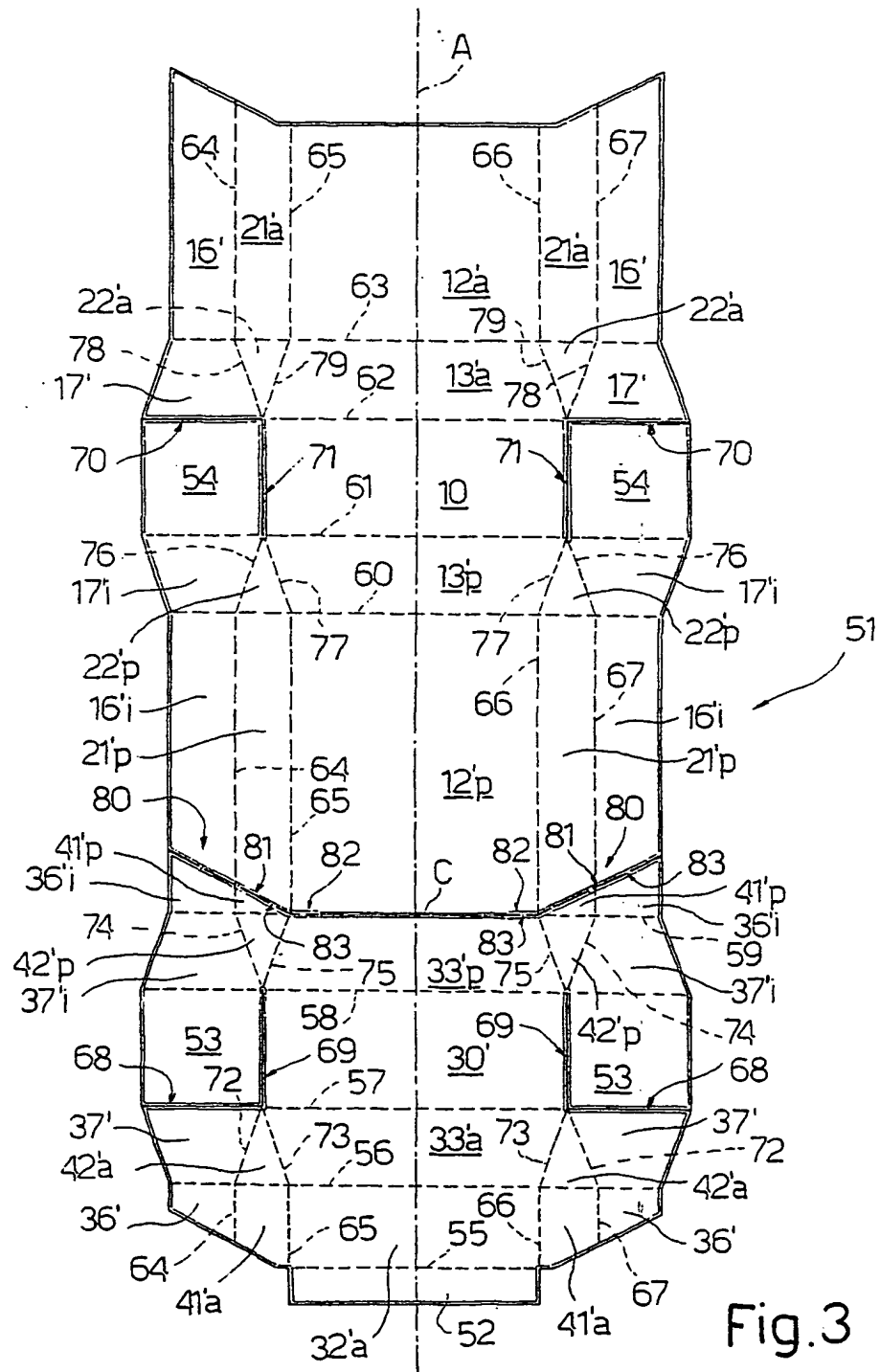
16) A blank as claimed in Claim 15, characterized in that said preformed fold line (59) is a fold line by which to form a second panel (33p) of said packet (1).

15 17) A blank as claimed in any one of Claims 14 to 16, characterized by comprising bridges (83) located along said slit (80) to connect the panels (12p', 21p', 16i') of the container (3) to the panels (33p', 41p', 36i') of the lid (5).

20 18) A blank as claimed in Claim 17, characterized in that said bridges (83) are torn, in use, when the packet (1) is unsealed.



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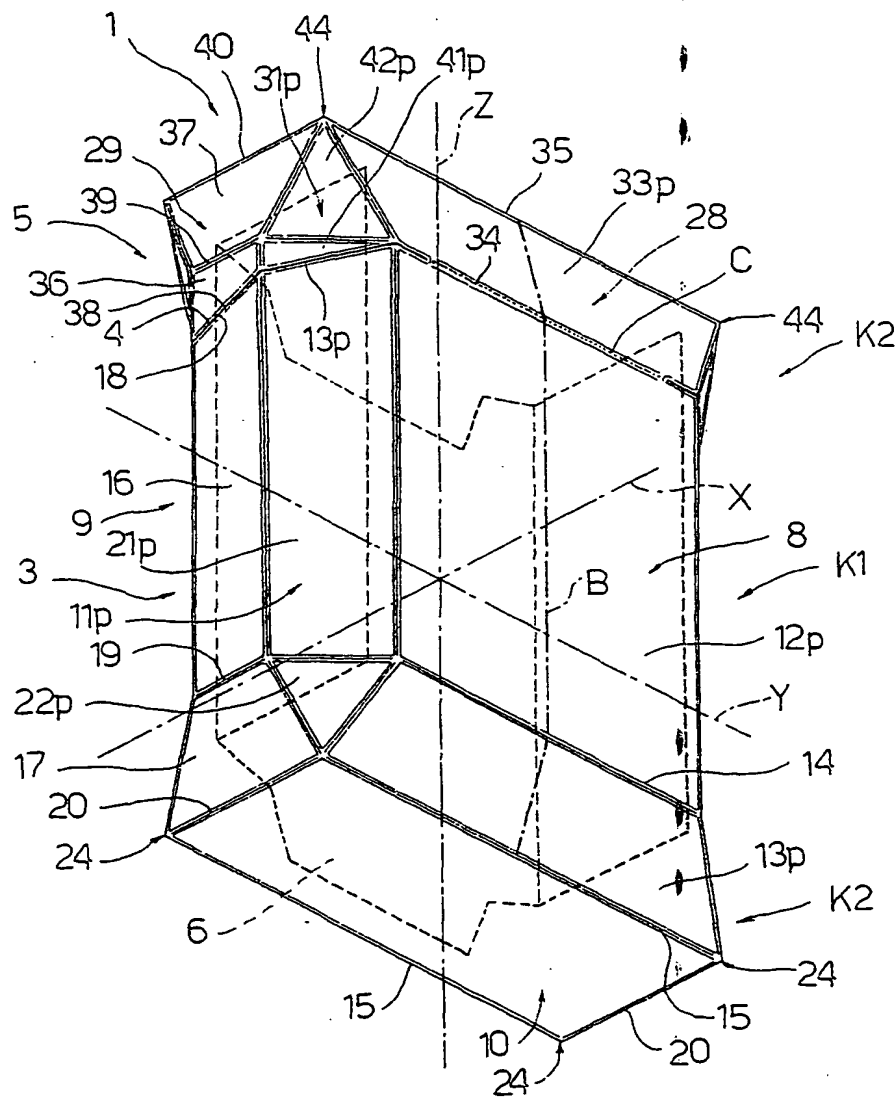


Fig. 5

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 7 B65D85/10 B65D5/66

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
IPC 7 B65D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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Date of the actual completion of the international search

8 March 2002

Date of mailing of the international search report

15/03/2002

Name and mailing address of the ISA

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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

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